

NOTE ON THE TYPE-SPECIMEN OF *BELEMNOTEUTHIS MONTE-FIOREI*, J. BUCKMAN, FROM THE LOWER LIAS SHALES BETWEEN CHARMOUTH AND LYME REGIS, DORSET.

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PLATE I.

ABOUT twenty years ago Professor J. Buckman¹ described a specimen from the Lower Lias shales between Charmouth and Lyme Regis that he named *Belemnoteuthis Montefiorei*.

His description is very short, the chief characters enumerated being as follows:—

“The original is nearly twelve inches in length. It is surmounted by ten rows of dark black spines; four double rows=8 are $1\frac{1}{4}$ in. long, while two are 2 in. The hooks are smooth, and of a dark black colour, some of them are as much as two lines in length, and all of them being more or less curved.

“These hooks were doubtless attached to the arms of the animal, which were prehensile organs.”

“It will be seen that these rows of hooks are inclined to one side, no doubt arising from the contortion of the soft parts forming the neck.”

“The dark elevated mass below is the ink-bag,” which, “with its tube, is $3\frac{1}{2}$ inches long.”

“Below the ink-bag is seen a small pointed projection, $\frac{3}{8}$ of an inch in length; this represents the phragmacone of the true Belemnite.”

“Here then,” the author remarks, “we seem to have the remains of a most interesting creature connecting the Belemnite of the past, a fossil sepiaaceous animal now extinct, with the modern Calamary.”

The description concludes as follows:—

“A *Belemnoteuthis antiquus* was figured by Dr. S. P. Woodward from a specimen in the cabinet of Mr. William Cunnington; this is called *B. antiquus*, and was obtained from the Oxford Clay, near Chippenham. Our specimen, however, is from the Lias, and is, therefore, much older The *Belemnoteuthis Montefiorei* may then be characterised as a fine fossil form derived from the Lower Lias Shales of the county of Dorset.”

From his description quoted above it is evident that the author regarded this specimen as generically identical with the forms from

¹ J. Buckman, “On the *Belemnoteuthis Montefiorei*”: Proc. Dorset Nat. Hist. & Antiq. Field Club, vol. iii (1879), pp. 141-143: 1 pl. The volume is dated 1879, but in his paper Professor Buckman speaks of “October of last year (1879),” which would lead one to consider that the paper was neither read nor published before the year 1880.

the Oxford Clay of Chippenham that had been described by Pearce¹ many years previously under this same name. It is fortunate for the sake of comparison that the genus *Belemnoteuthis* is so well known; indeed, few fossilized animals have left more complete remains.

The type-specimen of *Belemnoteuthis Montefiorei* is now in the British Museum collection (No. C. 5,026). It does not bear an original label stating it to be the figured specimen, but a comparison with Professor Buckman's figure leaves no room for doubt. Since the figure was drawn for his plate, the uppermost portion of the slab has been detached and replaced in such a manner that the arms have now the same general direction as the rest of the body.² There are six double rows of hooklets, although the relative position of the hooklets in the outermost row on each side is not quite so clearly indicated as in the rest. In these double rows the bases of the hooklets on one side are opposed to the bases of the hooklets on the other side, clearly showing that each double row belonged to only one arm. Hence in this specimen there are indications of only six arms. The two outermost arms are, as Professor Buckman stated, longer than the rest; they were apparently more slender, and we note also that their hooklets are more sparsely distributed than on the remaining four arms. Of the latter, the two outer ones are, as shown in Professor Buckman's figure, a little longer than the others.

The arms, in fact, can be arranged in three pairs; the first pair consisting of the two outer arms; the second, the two intermediate ones; and the third, the two inner ones. The enlarged drawing given by Professor Buckman admirably shows the form of the hooklets, and enables one to compare them on the one hand with the hooklets of *Belemnoteuthis*, so well figured by Owen³ and others, and on the other hand with those which have been found associated with the guards of Belemnites and figured by Huxley⁴ in his classical work on the structure of the Belemnitidæ (pl. i, figs. 1a, 2a). The thickened obtuse character of their bases enables us to distinguish them from the hooklets of *Belemnoteuthis*, that have their bases simply drawn out to a point, and to identify them with those of *Belemnites*. If, therefore, the hooklets belonged to the same animal as the rest of the remains—and we see no adequate reason for supposing that they did not—their character warrants the separation of the present specimen from *Belemnoteuthis* and its reference to *Belemnites*.

Then with regard to the *number* of the arms. There are now in the British Museum collection a number of specimens (sixteen) from the Lias in the neighbourhood of Charmouth and Lyme Regis, each exhibiting similar uncinated arms associated usually with an ink-bag, and sometimes also with portions of a nacreous pro-ostracum.

¹ J. C. Pearce: Proc. Geol. Soc., vol. iii (1842), p. 593.

² When figured by Professor Buckman the broken edge *ab* (in the Plate accompanying this paper) was joined to the edge *cd*.

³ R. Owen: Phil. Trans., 1844, pls. iii, v, and vi (especially). See also J. C. Pearce: London Geol. Journ., No. 2 (Feb. 1847), pl. xvi.

⁴ T. H. Huxley: Mem. Geol. Surv., Monog. ii (Structure of the Belemnitidæ), 1864.

We have carefully examined all these, and in no instance have we been able to make out more than six double rows of hooklets indicating six uncinated arms. Unfortunately, in neither of the examples figured by Huxley¹ that show the hooklets and other remains of the body associated with the guard, are the arms well preserved; in the example of *B. Bruguierianus* (pl. i, figs. 1, 1a) there are only a few scattered hooklets, while the arms of *B. elongatus* (pl. i, figs. 2, 2a) are represented by a confused mass of hooklets. In five examples, however, we have been able to clearly make out six uncinated arms; of these specimens four (bearing the register numbers 47,020, 47,716, 82,985, and C. 3,007 respectively) are from the Lias of Lyme Regis, and one (bearing the register number 39,901) is from the Lias of Charmouth. In his monograph on the structure of the Belemnitidæ Professor Huxley states (p. 16)—“I have not been able to make out more than six or seven arms in any specimen, nor has any exhibited traces of elongated tentacula, though the shortness of the arms which have been preserved would lead one to suspect their existence.” It is, of course, quite possible that one of the double rows of hooks might become separated during fossilization, and so give the appearance of a seventh arm; but from the above-mentioned observations it seems fairly safe to conclude that those Belemnites, of which any remains of the arms have been obtained, had only six *uncinated* arms. On the other hand, *Belemnoteuthis* had at least ten arms (each provided with a double row of hooklets), as is very plainly shown by a specimen in the British Museum collection (No. 25,966) from the Oxford Clay of Christian Malford, that was figured by G. A. Mantell in his “Petri-fications and their teachings,” 1851, p. 459, fig. 100.² Although the evidence of the number of the arms cannot be regarded as positive, because the present specimen may originally have possessed other arms which are not now preserved, yet the balance of the evidence is certainly in favour of the separation of the specimen from *Belemnoteuthis*, and of its association with *Belemnites*.

We fail to see any ground for the outline of the body as given by Professor Buckman. True, there are marks on the slab in about the positions indicated in the figure, but these are simply tool-marks that have been made during the development of the fossil, and certainly have nothing whatever to do with the form of the animal's body.

Professor Buckman considered that the “small pointed projection, $\frac{3}{4}$ of an inch [19 mm.] in length,” which is seen “below the ink-bag,” represented “the phragmacone of the true Belemnite.” The posterior portion of the ink-bag has been broken away since the specimen was figured, but the “small pointed projection” still remains. We have examined this very carefully, but have failed to recognize in it the representative of “the phragmacone of the true Belemnite”; it is styli-form, 2.5 mm. wide at the anterior end, 1 mm. wide at the

¹ T. H. Huxley: Mem. Geol. Surv., Monog. ii (Structure of the Belemnitidæ, 1864, pl. i, figs. 1, 1a (*B. Bruguierianus*), and 2, 2a (*B. elongatus*).

² See also G. A. Mantell, “Medals of Creation,” vol. ii (1854), p. 460, fig. 145; and J. Prestwich, “Geology,” vol. ii (1888), p. 218, fig. 116.

posterior end, and has a longitudinally-wrinkled surface; it shows no traces whatever of septation, and, so far as we can see, is not of the nature of a phragmocone. So far as we know, no similar structure has been observed in *Belemniteuthis*. It is, however, known that the pro-ostracum of some species of *Belemnites* possessed a central ridge which was continued on to the conotheca; this styliform projection may have been a portion of such a ridge, but we are not able to state definitely; at any rate, we see nothing to prevent us from regarding both it and the adjacent fragments of shelly matter as parts of the crushed phragmocone with its conotheca and pro-ostracum. Fragments of the nacreous pro-ostracum are also seen lying upon and near the ink-bag with its contents.

Since the characters exhibited by the British Museum specimens from the neighbourhood of Charmouth and Lyme Regis, in common with the present example, agree with the corresponding structures, so far as they are known, in those examples of *Belemnites* that have been described, in which the remains of the animal are associated with the 'guard,' we feel justified in referring them all to the 'genus' *Belemnites*. It is not, however, possible to refer the present specimen to any described form, because the species of this genus hitherto described have been founded upon the shape of the 'guards.'

The specimen may then be known either as *Belemnites Montefiorei*, J. Buckman, sp., or simply as *Belemnites* sp. By adopting the former name the identity of the specimen is retained; but as somewhat similar remains of *Belemnites*, having the hooklets of the arms, the ink-bag, and portions of the internal shell in conjunction, are found at different horizons, this might lead to some confusion, because all such specimens might be referred to this species. It is, however, most probable that the specimens obtained at different horizons belonged to different species, but, according to our present knowledge, the form of the hooklets, and the nature of the ink-bag and fragments of the internal shell, are not sufficient to distinguish these species. We do not, for example, see how, in the absence of the guards, the two specimens figured by Professor Huxley (op. cit.) under the names *Belemnites Bruguerianus* (pl. i, fig. 1) and *B. elongatus* (pl. i, fig. 2) respectively could be distinguished. In the circumstances it seems therefore desirable, so far as the present specimen is concerned, to discard any specific name, and simply write—*Belemnites* sp.
